

ABSTRACT OF THE DISCLOSURE

A consistent time service that provides a method of maintaining deterministic clock-related operations for a group of replicas in a fault-tolerant distributed system. A consistent clock synchronization algorithm is utilized that yields a single consistent group clock for the replicas in the group, and does not require synchronization of the underlying physical hardware clocks. The consistent group clock ensures the determinism of the replicas in the group with respect to clock-related operations, is monotonically increasing, has bounded increment, skew and drift. The consistent time service provides benefits for active replication during normal operation, as well as passive replication and semi-active replication to ensure a consistent monotonically increasing clock when the primary replica fails and a backup replica takes over as the new primary replica. The consistent time service provided is transparent to the application and guarantees group clock consistency despite replica failures or adding new or repaired replicas.